

ATGAGAGTGAAGGGGATCAGGAGGAATTATCAGCACCTTGTGGAGATGGGGCACCACATGCTCCTTGGGATGTTGATGATCTG
 TAGTGCTGCAGATCAATTGTTGGTGCAGCTATTATGGGTGCTGTGTGGAAAGAGCAACCCACCTACTATTTTGTG
 CATCAGATGCTAAAGCATATAGTACAGAGGTACATAATATTGGGCACACATGCTGTGTACCCACAGACCCAGCCCA
 CAAGAAATAGTAATGGAAATGTGACAGAGGTTCAACATGTGGAATAAATACATGGTAGAACAGATGCATGAGGATAT
 AATCAGTTTATGGGATGAAGCCCTAAAGCCATGTGTAAATTAATCCACTCTGTGTACTCTAAATGCACTACTGAGT
 TGAATCTTCTAAATGCAATTGATAATAGTACTAATGATAAATGTATACCGCCAGATCAAAAAGGAGAAATGAAAACCTGC
 TCTTTCAATATCACCGCAGGCATAAGAAATAAGGTGCGGAAGAATATGCACCTTTTATACAAGTGTAGTACCAAT
 AGATAATGATACCTGTTATAGATTGATAAGTTGTAACACCTCAATATACACAGGCTGTCCAAAGGTATCCTTTG
 AGCCAAATCCCATACACTATTGTGCCCCGGCTGTTTGGCAATTAAGTGTAAAGTAGGAATTTCAATGGAACAGGA
 CTATGTAAATGTCAGCACAGTACAAATGACATGGAATAGGCCAGTAGTACAATCAACTGCTGTAAATGGCAG
 TCTGGCAGAAAAGAGATAGTAATAGATCTGAAAATTTACGGGCAATGCTAAACCAATTAATAGTACAGCTGCCTGAAA
 TAGTACACTTAATTGTACAAGCTTAACAAATAATAAGAAAGGTCTACGTATAGGACCAGGGAGAGCATGGTGGTAT
 GCAACAAGAGGAATAATAGGAAAATGAGACAAACACATGCAACATTAGTAGAGTAAATGGAATAACACTTTAGAACAA
 GATAGTTAAAAAATTAGGAGACAAATTTGGGACTAATAATAAACAATAATTTAATCAATCCTCAGGAGGGGACC
 CAGAAATTACATGCACACTTTTAAATGTGGAGGGAAATTTTACTGTAATACACACAACCTGTTAATAGTACTTGG
 ATTCGGAATGGTACTGATTGGACTCGAAATGATAGTGAAGGATCAGACATCACTAACGAAAATATCAGCTCCCATGTAG
 AATAAACAAATTAACATGTGCAGAAAGTAGGAAAGCAATGTATGCCCTCCCATCAGTGGACAAATTAGCTGTT
 CCTCAATATTACAGGGCTGCTATTAAACACAGATGGTGTGTTGCTGTACACGGACGCGAACACGTCACCTTCAGA
 CCGGAGGAGGAAATATGAGGGCAATTTGGAGAGTGAATTAATAATAAAGTAAAGTTGAACCAATAGGAAT
 AGCACCACCAAGGCAAGAGAGTGTGCAGAGAGAAAAGAGCAGTGGGAATAGCAGCTATGTTCTTGGGTTCT
 TGGAACACAGCAGGAAGCGCTATGGGCGCAGCTCAGTGACGCTGACGTACAGCCAGACAAATTAATTGCTGGTATAGTG
 CAACAGCAGAACAAATCTGCTGAGGGCTATTGAGGCGCAACAGCATATGTTGCAACTCACAGTCTGSGGCATCAAGCAGCT
 CCAGGCAAGAGTCTTGGCTGTGGAAGATACCTAAGGGATCAACAGCTCCTGGGAATTTGGGGTTGCTCTGGAACCTCA
 TTTGCACCACTGCTGCTTGGCTTGGAAATAGTGTGGAGTAAATAGATCTCTGGGAGACATTTGGGAAATGATAACATGACC
 TGGATGAAGTGGGAAAGAGAAATGATAATTACACAGCTATATACACCTTAATTGAAGAAATCGCAGAACCGCAAGA
 AAAGAATGAAGTGAATTAATTGGAATTAGACAAATGGGACAGTTTGGAGTTGGTTAGCATAACAAACTGGCTGTGGT
 ATATAAAATATTCATAATGATAGGAGGCTTGATAGTTTGAAGTATGTTTGTAGTGCTTTCTATAGTGAATAGA
 GTTAGGCGAGGATACCTACCAATTGCTGTTTTCAGACCCGCCCCCAGCCCCGAGGGGACCCGACAGCCCCGAAGGAATCGA
 AGAAGAAGGTGGAGAGAGACAGACAGATCCGGCAGATTAGTGGATGGATTCTTAGCACTTATCTGGTTCGACCTGC
 GGAGCTGTGCTTTCAGCTACCAACCGCTTGAGAGACTTACTTTGATTGCAGCAGGATTGTGGAACCTCTGGACGC
 AGGGGTGGGAACTCCTCAAGTATTGTTGGAATCTCTACAGTACTGGAGTCAGGAATAAAGAAATAGTGTAGCTT
 GCTTAATACCATAGCAATAGCAGTAGCTAGGGGACAGATAGGGTTATAGAAATAATACAAAGAGCTTGTAGAGCTATTC
 TCCACATACCTAGAAGATAAGACAGGGCTTTGAAAGGGCTTTGCTATAA

FIG. 1

ATGAGAGTGAAGGGGATCAGGAAGAATTATCAGCACTTGTGGAGATGGGCACCACATACCTCTTGGATGTTGATGATCTG
TAGTGCTGCAGATCAATTGTGGGTACAGCTATTATGGGTGCTGTGTGAAAGAAGCAACACCACCTCTATTTTGTG
CATCAGATGCTAAAGCATATAGTACAGAGGTACATAATATTTGGGCCACACATGCCTGTGTACCCACAGACCCAGCCCA
CAAGAAATAGTAATGGAATGTGACAGAAGAGTTCAACATGTGGAATAATACATGGTGAACAGATGCATGAGGATAT
AATCAGTTTATGGGATGAAGCCTAAAGCCATGTGTAATAATTAACCTCACTCTGTGTTACTCTAAATTCACACTAGT
TGAATCTTCTAAATTGCATTGATAATAGTACTAGTGGTAAACACTGATAATAGCACTAGTAGTAATAGTACTGATGAT
AAATGTATACCGCCAGATCAAAAAGGAAAAATGAAAACTGCTCTTCAATATCACCGCAGGCATAAGAGATAAGGTGCG
GAAAGAAATGACATTTTATACAAAGTGTAGCACCAATAGATAATGATGCTATCAGTTATAGATTGATAAGTTGTA
ACACCTCAATCATTACACAGGCTGTCCAAGGTATCCTTTAGGCCAATTCACATACACTATTGCCCCGGCTGGTTTT
GCGATTCTAAAGTGTAAAGTAGGAATTTCAATGGAAACAGGACTATGTAAATGTACACAGTACAATGTACACATGG
AATTAGGCCAGTAGTCAACTCAACTGCTGTTAAATGGCAGTCTGGCAAAAAAGAGATAGTAATAGATCTGAAAAT
TCACGGCAATGCTAAACCAATAATAGTACAGCTGCTGAAATAGTACACATTAAATGTACAAAGACCTAACAAATAATA
AGAAAAGTCTACGTATAGGACGAGGAGAGCATGGTGTATGCAACAAGAGGAATAATAGGAAAAATGAGACAAACACA
TTGCAACATTAGTAGAAAAATGGAATAACACTTAGAACAGATAGTTAAAAATTAGGAGACAAATTTGGGACTAATA
ATAATAAACAAATAATTTAATCAATCCTCAGAGGGGCCAGAAATTACAATGCACACTTTTAAATGTGGAGGGAA
TTTTTTACTGTAATACACACAACCTGTTTAAATAGTACTTGGATTGGAATGGTACTGATTGGACTCAAAATGATACTGA
AGGATCAGACATCACTAACGAAATATCACGCTCCCATGTAGATAAACAATAATTAACATGTGGCAGGAAGTAGGGA
AAGCAATGTATGCCCTCCCATCAGTGGACAAATTAGCTGTTTCATCAATATTACAGGGTCTGCTTTAACACACGATGGT
GTTGTTGGTCTGTACACGAACGCAACACGTGACCTTCAGACCGGGAGGAAATATGAGGGACAAATGGAGAAGTGA
ATTATATAATAAAGTAATAAAGTTGAACCAATAGGAATAGCACCCACCAAGGCAAGA3AAGAGTGGTGCAGAGAG
AAAAAGAGCAGTGGGAATAGGAGCTATGTTCTTGGGTTCTTGGAAACAGCAGGAAGCGCTATGGCGCAGCGTCAGTG
ACGCTGACGGTACAAGCCAGACAATTATGCTGTTAGTCAACAGCAGACAATACTGCTGAGGGCTATTGAGCGCA
ACAGCATATGTTGCAACTCACAGTCTGGGGCATCAAGCAGCTCAGCAAGAGTCTTGGCTGTGGAAGATACCTAAGG
ATCAACAGCTCCTGGGAATTTGGGTTGCTCTGGAACACTGTTGCACCCTGCTGCTTGGAAATGGAATGATGTTGGAGT
AATAGATCTCTGGGAGACATTTGGGAAATGATAACATGACCTGGATGAAGTGGGAAAGAGAAATGATAATTACACAAG
CTATATACACCTTAATTGAAGAAATCGCAGAACCCAGCAAGAAAGAAATGAACCTAGAAATTTGGAAATAGACAAATGGG
ACAGTTTGTGGAGTTGGTTAGCATAACAACTGGCTGTGGTATATAAAATATTCATAATGATAGTAGGAGGCTTGATA
GGTTAAAAATAGTTTTAGTGTCTTTCTATAGTGAATAGATTAGCAGGGTACTCACCATTGCTGTTTCAGACCCG
GCCCCAGCCCCGAGGGACCCGACAGGCCCGAAGGAATCGAAGAAGAGGTGGAGAGAGACAGACAGATCCGGCA
GATTAGTGGATGGATTTCTAGCATTATCTGGGTGACCTGCGGAGCTGTGCTTCCAGCTACCAACCGCTTGAGAGAC
TTACTCTTGATTGCAGCGAGGATTGTGGAACCTCTGGGAGCGAGGGGTGGAAAGTCTCAAGTATTGTTGGAAATCTCCT
ACAGTACTGGAGTCAGGAACATAAGAAATAGTGTCTGTTAGCTTGTAAATACCATAGCAATAGCAGTAGCTGAGGGGACAG
ATAGGGTTATAGAAATAATACAAAGAGCTTGTAGAGCTATTCTCCACATACCTAGAGAATAAGACAGGGCTTTGAAAGG
GCTTGTCTATAA

FIG. 2

algaagaglaagaggagaatacagcagcttggagaglvggggglvgaglgggggccacalgcctctgggaattgtgatgat
ctglaglgtacagaaaaatttgggtcacagltatattgggttacctgtlvgaaaggaagcaaccacacictatttt
gtgcacagatgtcaagcalatglacagagglacataatgttgggccacacalgtcctglgtaccacagagcccaac
cacaagaaglatattglaaattgicagagaattttaacatltggaaaaatgacatgtttagaac-agatgtcalgagga
tataatcagttatggatcaaaagccctaaagccatglaaataccccacictgtttagtttaaggtgcacgtatt
tgaagaatgatacctaacatagtagltagcgggagaatgataaattgagaaagagagataaaaaacgtctcttcaat
alccagcagcaltagaggltagaggtgcagaagaatlatgtatttttataacatgtatataaccataagataatga
tataccagclataagtgacaagttgaacccctcagltacacacagggccttccaaaggttactcttggaccaatlc
ccatactatttggccccgtgttttgcgattcclaaagttaataaagcgttcaatlggaacaggaacalgtaca
aatgtcagcagatacattgatacatalgtgaattagccagtagtatacctaactcaactgtctttaaattggcagltagcaga
taagaggttagtattatgtctgtcaattccaggaacalgtcdaaaccataalaglacagctgtaacacactlgtagaa
aataatgacagaaccaacaatacagacaagaataacgtatccgtalagcagagagcaggaagcattgtitacaata
ggaaaaattgaaatatgacacacatgtacatagtagcagaatggaaataacatttaaaacatgataagctag
caaatgaagagaacatttggaaataaataaataactttaagcaatcctcaggaggggagccagaaattgatacgc
acagtttaatttgggggggaatttttactlgtatccaacacactgttaattagltactgttttaattagttacttgg
agltcgaagggtcaataacacatgagggaagtagacaatacctcccalgtcagaaataaaaaataataaacaalgtg
gcagaagaagtaggaagaagtaattgtccctccatcagtgagacaattagatgttcaataataatagcagggtctat
taacagaagatgttgtaataaglacacaacatgtgtccagattcagactgtgagggagagatagaggacaattgtgaga
aggaataaagagcagltgggaatagagcttcttctgttctggagcagcaggaagcagcaltgtggcgagct
caatgaactataataataaagltgaataattgacacttaagtagccccaacaggcaagaagagaggtgtgca
caltgaactgtacggtagcagccagacaattgtctgtatagtcagcagcagaacaattgtgdagggctaltgtag
ggcacaacagctgtgtcaacacagctgtggggcaltcaagcagctcaggcaagaalctcgtgtgtgaaagatacct
aaaggtacaacagctcgtgggaatttgggtgtctgtggaatacactatgtcaccactgtgtcgttggatgtctgtt
tgaataataatctcttgagaacagattgtatcaacagactgtgagltggagltggagcagagaataatacaatacacaagc
ggagtaataatctgtgaataatgcgaataacccagcaagaagaatgaacacagaattatggaaatagataaattgggc
aagtttggaaattgttaacatacaaaattggctgtgtgtataaaattatcaattatagtagltaggaggtctgttag
gttgaagatagttttgttactttctatagtgaaatagtagtggcagggatattccactatctgttccagccac
ctcccaaccccgaggggaccgcagacggccgaagaagaataagaagaaggttggagagaagagacagagacagatccattct
atlagtgaacggatcttggcactatctgttggaactgtcggagctgtcggagctgtcccttccagctacacacgtgttagagact
tactctgtattgacaggaatttggaaacttctggagcagcaggggttgggaagccctcaaatattgttggaaictcta
caggtttaggtagcagaactaagaataagltgtgttagctgtctcaatgccacagccatagcagtagctgtgagggagacaga
taggtttagaagtaglacaaaggagcttagagctatctgccacalacctagagaataaagacaggggtgtggaagga
ttttgtataa

1	MRVK...EKY	QHLWRWGWRW	GTMLLGMLMI	CSATEKLWVT	VYYGVPVWKE	50
	WEAU1.6	----	IM--I--	--AEN--	----	
	AD3.V6	----	GTI--M--	--ADQ--	----	
	AD3.V22	----	GTI--M--	--ADQ--	----	
51	ATTTLFCASD	AKAYDTEVHN	VWATHACVPT	DPNPQEVVLV	NVTENFNMMWK	100
	WEAU1.6	----	V-----	--V-LE	--N----	
	AD3.V6	----	I-----	--S--I-ME	--E----	
	AD3.V22	----	I-----	--S--I-ME	--E----	
101	NDMVEQMHEd	IISLWDQSLK	PCVKLTPLCV	SLKCT.....	.....	150
	WEAU1.6	----	-----Q-	T-N--N....	.....VNV	
	AD3.V6	----	-----E-	T-N--TELNL	LNCID.....	
	AD3.V22	----	-----E-	T-N--TELNL	LNCIDNSTSG	
151	DLKNDTNTN	SSSGRMIM..	EKGEIKNCsf	NISTSIRGKV	QKEYAFFYKL	200
	WEAU1.6	SSSGEKM..	EE-EM-----	-VTTL--N-R	KT---L--KL	
	AD3.V6	-----	TNDKCIPPD	QK-EM-----	-ITAG--N-V	RK---L--TS
	AD3.V22	TDDKCIPPD	QK-KM-----	-ITAG--D-V	RK---L--TS	

Fig. 4A

	201	V2	250
HXB2	DIIPID..ND	TTSYKLTSCN	TSVITQACPK VSFEPIPIHY CAPAGFAILK
WEAU1.6	-VM-----R-	NT--T-IN-K	S-T-----
AD3.V6	-VA-----N-	TI--R-IS-N	T-I-----
AD3.V22	-VA-----N-	KI--R-IS-N	T-I-----
	251		300
HXB2	CNNKTFNGTG	PCTNVSTVQC	THGIRPVVST QLLNGSLAE EEVIRSVNF
WEAU1.6	-NDKK---K-	P-K-----	-----E EDI-----E--
AD3.V6	-KDRN---T-	L-K-----	-----E K-I-----E--
AD3.V22	-KDRN---T-	L-K-----	-----K K-I-----E--
	301		350
HXB2	TDNAKTIIVQ	LNTSVEINCT	RPNNNTRKRI RIQGRSRA. FVTIGK.IGN
WEAU1.6	-----N----	NVSLE----	-----T--KI TL.....VL YTTGEI.--D
AD3.V6	-----T----	PEIVH----	-----I--GL RI.....AW WYATRGI--K
AD3.V22	-----T----	PEIVH----	-----I--GL RI.....AW WYATRGI--K
	351	V3	400
HXB2	MRQAHCNISR	AKWNNTLKQI	ASKLREQFG. .NNKTIIFKQ SSGDFFEIVT
WEAU1.6	I-RA---L--	TS-----K--	VE--REIKQF .K-----V-K- -----VM
AD3.V6	M-QT---I--	VK-----E--	VK--GDKFGT NN-----I-N- -----TM
AD3.V22	M-QT---I--	EK-----E--	VK--GDKFGT NN-----I-N- -----TM

Fig. 4B

	401	HSFNCGGEFF	YCNSTQLFNS	TWFNSTWSTE	GSNNTGSD.	...TITLPCR	450
HXB2		-S-----	-S-----	--HANGT.WK	N....--A-	.NN-----	
WEAU1.6		-T-----	-T-----	--IRNGTDWT	R.ND---S-I	TNEN-----	
AD3.V6		-T-----	-T-----	--IRNGTDWT	Q.ND---S-I	TNEN-----	
AD3.V22							
	451	IKQIINMWQK	VGKAMYAPPI	SGQIRCSSNI	TGLLLTHDG.	.GNSN.NESE	→V500
HXB2		-----R-E	-----	E--R-L---	-----R--	.-SSEENQTE	
WEAU1.6		-----M-K	-----	S--S-S---	-----H-V	V-LYTDANNV	
AD3.V6		-----M-E	-----	S--S-S---	-----H-V	V-LYTANNVV	
AD3.V22							
			(OH BINDING)				
			510				
		I FRPGGGDMR	DNRSRSELYKY	KVVKIEPLGV	APTKAKRRVV	OREKR	← g p120 ends
HXB2							

Fig. 4C

1 80

HXB2	MRVK...EKY QHLRWG...	WRWGTMLLG	MLMICSATEK	LWTVVYGV	VPVKKEATTTLF	CASDAKAYDT	EVHNVWATHA
92UG046-T8	-----IERN-----	-----ERNOHS	LWR-I	-----KG..E	-----	-----S-EP	-A-I-----
93UG086-T8	-----IQENC-N-----	-----II-----	-----MI-----	-----A-----	-----D-E-----	-----	-A-----
92US077-T8	-----I-KN-----	-----S-----	-----TML-----	-----Q-----	-----N-----	-----	-A-----
93US143-T8	-----IMKN-----	-----F-----	-----L-----	-----ADQ-----	-----T-----	-----K-----	-M-----
96USHIPS4-T8	-----I-NNW-----	-----	-----TML-----	-----Q-----	-----R-----	-----S-----	-A-----
96USHIPS9-T8	-----EIMKN-----	-----W-G-----	-----I-----	-----A-Q-----	-----	-----	-K-----
96USSN20-T8	-----TQKS-PL-----	-----	-----IIFW	IMV-N-N	-----RD-E-----	-----	-I-----
AD3.V6	-----GIRN-----	-----	-----	-----ADQ-----	-----	-----S-----	-I-----

81 160

HXB2	CVPTDPNPQE	VVLNVVTENF	NMWKNDMVEQ	MHEDIISLWD	QSLKPCVKLT	PLCVSLKCTD	LKNDTNTNS	SSGRMIME..
92UG046-T8	-----R- IK-E-----	-----	-----	-----V-----	-----	-----T-H-E	Y-APNA-IN	ATD-D-....
93UG086-T8	-----IN-E-----	-----N-----	-----	-----T-----	-----Q-----	-----T-D-..	.....-DA	TNATNTTIS
92US077-T8	-----I-A-----	-----D-----	-----	-----	-----	-----T-N-----	VR-G-IVRN	TI-VEEGM.
93US143-T8	-----F-----	-----I-----	-----	-----D-----	-----T-----	-----T-N-----	DLR-A--TT	NTNSN.W-KP
96USHIPS4-T8	-----L-E-----	-----	-----	-----	-----R-T-----	-----	Y.EGNAN-T	IDNATKNSW.
96USHIPS9-T8	-----E-----	-----	-----	-----	-----	-----T-N..	..R-V-I--T	TTNSSGW.KL
96USSN20-T8	-----IP-E-----	-----N-----	-----	-----D-----	-----	-----T-N--H	NFN-FNSS-N	TPINNTIYN
AD3.V6	-----D-- I-ME--E-----	-----N-----	-----	-----E-----	-----	-----T-N--T	ELNLLNCIDN	TNDKCIPPD

161 240

HXB2	..KGEIKNCS	FNISTSIRGK	VQKEYAFFYK	LDIIPIDNDT	.....	TSYKLTSCN	TSVITQACPK	VSFEPIPIHY
92UG046-T8	....GM-----	--VT-EVIN-	KKQ-H-L---	--VVQM-DNS	TN.....	..N-R-IN-	-----	-T-----
93UG086-T8	DM-----	--MT-ELKD-	T-VRS-----	M--VQ-N--N	NSNSNSSQ..	...R-I--	-----	-----
92US077-T8	..E-----	--VT-M-D-	L--D-----	S-V--G--N	NTNTSNNIT	Y--R-R-	-----	IN-----
93US143-T8	ME-----	--K-TS--D-	--Q--L--S	--VV--K-NN	NISNK....	..R-R-R-	-----	-T-----
96USHIPS4-T8	-----T-----	--VT-A--D-	-K-Q--L-HS	--VV--KDAK	DSN.....	..R-I--	-----	-Y-----
96USHIPS9-T8	-----	--K-T-IL-H-	M-E-H-L--	S-VV-LG-NS	AIGNNN....	..AR-R-I-	-----	-T-----
96USSN20-T8	-----	--TT-EL--	TK-Q--L-N-	--VVQ-NDKN	NSHNNRR..	...M-IH-	-----	-T-----
AD3.V6	.Q--M-----	--TAG-N--	-R--L--T	S-VA-----	.....	..I-R-I-	-----	-----

Figure 6A

[illegible]

Figure 6B

481		→ V5	←	gpl20 ends	535			
HXB2	TGLLLTRDGG	NSNN...ESEI	.FRPGGDMR	DNWRSELYKY	KVVKIEPLGV	APTAKARRVV	QREKRAVG.I	GALFLGFLGA
92UG046-T8	-----	...-NTRQNE	A-----	-----	-R-----L	-E-----	E-----I-.L	-M-----
93UG086-T8	--I-----	D...NNSTNE	T-----	-----	-----	-R-----	E-----IAG	-V-----
92US077-T8	-----	-T-DTNNT--	.-----	-----	-----I	-----	-----M-	-----
93US143-T8	-----	VDE-SNTT-T	.-----N-	-----	-A-----	-----	-----	-V-----
96USHIPS4-T8	-----	-I-ETNCT--	.-----A-	-----	-----I	-----	-----V	-M-----S-
96USHIPS9-T8	-----	..S-TNTT-V	.-----N-K	-----	-----	-----	-----	-----
96USSN20-T8	-I-----	K...INSTNE	T-----	-----	-----H	-----E	-----V-	-V-----
AD3.V6	-----H-V	VGLYTDANNV	T-----N-	-----	-I-V-I-I	-----	-----	-M-----T
HXB2	AGSTMGAASM	TLTVQARQLL	SGIVQQNNL	LRAIEAQHL	LQTLVWGKIQ	LQARILAVER	YLKDQQLLGI	WGCSGKLICT
92UG046-T8	-----	-----M	-----	-----	-----	-----S	-----	-RH-----
93UG086-T8	-----L	-----T	-----S	-----	-K-----	-V-----	-----	-----
92US077-T8	-----	-----	-----	-----H-	-----	-V-----	-----F	-----
93US143-T8	-----I	-----	-----	-----	-----	-V-----	-----G-	-----
96USHIPS4-T8	-----V	-----	-----	-----H-	-----	-V-----	-----	-----
96USHIPS9-T8	-----L	-----T	-----	-----	-----	-V-----	-----	-----
96USSN20-T8	-----AI	-----	-----S	-----	-K-----	-V-L-	-----R	-----
AD3.V6	-----A	-----V	-----	-----M	-----	-V-----	-----R	-----
HXB2	TAVPWNASWS	NKSLEQIW..	NHTTWMEWDR	EINNYTSLIH	SLIEESQNOQ	EKNEQELLEL	DKWASLWNWF	NITNWLWYTK
92UG046-T8	-----S	-----NE--	GNM-----EK	-D--E-Y	-----T-	-----K-	-----Q-	S-K-----
93UG086-T8	-T-----S	-----YSE--	DNM--LQ--K	-S--QI-Y	D-----	-D-A-	N-----	D-SK-----R
92US077-T8	-----	-----DK--	NM--Q-E-	-D--Y	T-----	-L-	N-----	D-K-----
93US143-T8	-----	-----DR--	NM-----E-	-D--G-Y	N-----	-A-	-----	D-----
96USHIPS4-T8	-T-----T	-----KY--	DNM--Q--K	-S--G-Y	T-----	-K-	-----	D-----
96USHIPS9-T8	-T-----	-----DD--	QNM-----E-	-D--NV-Y	N-----	-D-A-	-----D-	S-S-----
96USSN20-T8	-N-----S	-----TFND--	NM--LQ--K	-----NT-Y	R-----	-D-A-	-----S-	DLS-----R
AD3.V6	-----S	-R-GD-EN	DNM--K-E-	-D--Y-Y	T-----	-L-	-D-S-	S-----

Figure 6C

HXB2	LFIMIVGGLV	GLRIVFAVL	IVNRVQGY	PLSFQTHLPT	PRGPDREPI	EEEGGERDRD	RSIRLVNGSL	ALIWDRLSL
92UG046-T8	I-----I	-----I	V-----V	-----L-A	-----L-A	-----QG-G	-----T-FS	-----N-
93UG086-T8	I-----I	-----I	VI-----VI	-----LA-N	-----G-L	-----Q-S	-----S-F	-----A-E
92US077-T8	I-----I	-----VI	-----VI	-----R-A	Q-----Q	-----G-G	T-GP--D-F	I--V----
93US143-T8	I-----I	-----T	-----T	-----H-A	Q-E-----Q	-----G	-----GP--D-F	I--V----
96USHIPS4-T8	I-----I	-----T	-----T	-----R	Q-----Q	-----	-----RTS-D-F	-----V----
96USHIPS9-T8	I-----I	-----I-T	-----I-T	-----RF-A	-----RF-A	-----G-K	-----GL--	-----FF--V----
96USSN20-T8	I--V-----I	A-----A	I-----I	-----LTHH	Q-E-----Q	-----G-Q	-----V--	-----F--A----
AD3.V6	I-----I	-----S	-----S	-----RP-A	-----RP-A	-----	-----G--D-F	-----V----
HXB2	CLFSYHRLRD	LLIVTRIVE	LLG.....	RRGWEALKYW	WNLLQYMSQE	LKNSAVSLLN	ATAIAVAEGT	DRVIEVQGA
92UG046-T8	-----RH--	I-AAK--	F-----F	-----	-----	-----	-----	-----
93UG086-T8	-----FI-AA-T	-----FI-AA-T	-----HSSLKGL	L--G--L	G--L-G--	--I--I--FD	TI--VI-GW-	-----IG-RI
92US077-T8	F-----F	-----A	-----I	-----I	-----I	-----	-----	-----I--ARRT
93US143-T8	I-L-----I	-----I	-----V	-----V	-----	IN--	-----	-----IL-R-
96USHIPS4-T8	-----LA	-----LA	-----T-R	-----T-R	-----	SI--V	-----	-----RV
96USHIPS9-T8	-----AA	-----AA	-----I	-----I	-----	V--	-----	-----IL--L-R-
96USSN20-T8	-----AA-T	-----AA-T	-----HSSLKGL	L--G--L	-----S-G--	IN--D T--	-----NW-	-----IG-RF
AD3.V6	-----AA	-----AA	-----V	-----V	-----C	TI--	-----	-----II-R-
HXB2	CRAIRHIPRR	I ROGLERILL						
92UG046-T8	G---LN---	-----A-A-Q						
93UG086-T8	F---L---	-----A--						
92US077-T8	F---L---	-----A--						
93US143-T8	F---L---	-----A--						
96USHIPS4-T8	-----A--	-----A--						
96USHIPS9-T8	-----I---	-----A--						
96USSN20-T8	G---LN---	-----A-Q						
AD3.V6	-----L---	-----F-A-						

Figure 6D

Fig. 7

93UG086-T8 (SEQ ID NO: 11)

ATGAGAGTGAAAGGGGATACAGAGGAACTGTCAAAAATTGTGGAGATGGGGAACTATAATCTTGGGTATGATGATAATTTG
TAGTGCTGCAGAAAAAATTGTGGGTACTGTGTTTACTATGCGGTACCTGTGTGGAAGATGCGAAGAACCACTTATTTTGTG
CATCAGATCGGAAAGCATATGATACAGAAAGTGCATAATGTCTGGGCCACACATGCTGTGTACCTACAGACCCCAACCCA
CAAGAAATAAATTTGGAAAAATGTGACAGAAAAATTTAAACATGTGGAAAAATAACATGGTAGAGCAGATGCATACAGATAT
AATCAGTCTATGGGACCAAGCCTAAAGCCATGTGTACAGTTAACCCCTCTCTGTGTACTTTAGATTGTACTGATGCCA
CAATGCCACTAATACCACTATCATTTAGTGACATGAAGGAGAAATAAAAAAAGTCTCTTTCAATATGACACACAGAATTA
AAGGATAAGACACAGAAAGTACGTTCAATTTTCTATAAGATGGATATAGTACAAAATTAACAACAACACAGCAACAGCAA
CAGTAGTCAGTATAGATTAAATAAGTTGTAATACCTCAACCATACACAAGCTTGTCAAAAGGTATCCTTTGAGCCAAATTC
CCATACATTAATTGTCTCCAGCTGTTTGGGATTTCTAAATGCAAGGATAAGGAGTTCAATGGAACAGGGCCATGCGAG
AATGTCAGCACAGTACAATGCACACATGGAAATCAAGCCAGTAGTATCAACTCAACTACTGTGTTAAATGGCAGTCTAGCAGA
AGAAAGGTAATGATTAGTCTGAAAAATATCACAGACAATACTAAAAACATAATAGTGCAACTTACTGAGCCTGTAAAAA
TTAATTGTACCAGACCTAACAAATAACAAGAGGTTAAGTATAGGCCAGGACGAGCATTCATTGCAAGAGATAGA
ATAATAGGGATATAAGACAAGCACATTGTAAATCATAGTAGAGCGCATGGAAATAACATTTGCGAGAAGGTAGCCCAACA
ATTAAGAACACACTTTGAGAACAGAACAAATAATCTTTAATCACTCCGAGGAGGGGACCCAGAAATAACTACACATAGTT
TTAATTGTGGAGGAGAAATTTTCTATTGTAGCACAAACAGGCTGTTAATAGTACTTTGGAAATAGCAATGCCAGCACGCGAG
GGGTCAAAATAGCACGGGTTCAACGACACTATAACTCTCCAATGCGAATAAGGCAGATTATAAGGATGTGGCAGAGAGT
AGGACAAAGCAATGTATGCCCTCCCATCCAGGGGTAAATAAGATGTGACTCAAAACATTACAGGACTAATATTAAACAAGAG
ATGGGGGGGATAATAACAGACACAATAAGACCTTCAGACCTGGAGGAGGAGATATGAGGGACAAATTGGAGAAAGTGAATTA
TATAAGTATAAAGTAGTAAAGATTGAACCACTAGGAGTAGCACCCACAGGGCAAGAGAGTGGTGGAAAGAGAAAAA
AAGAGCAATAGCAGGAATAGGAGCTGTGTTCTTGGGTCTTGGGAGCAGCAGGAAGCACAAATTTGCTGAGGGCTATAGAGGCTCAA
CGCTGACGGTACAGACCAGACAGCTATTGTCTGGCATAGTGCACACAGCAAGCAATTTGCTGAGGGCTATAGAGGCTCAA
CAGCATCTGTTGAAACTCAGGCTCTGGGCAATTAACAGCTCCAGGCACGAGTCTGCTGTGGAGAGATACCTAAAGGA
TCAACAGCTCCTAGGAATTTGGGGTTGCTCTGGAAAACTCAATTGCAACCACTACTGTGCCCTGGAACTCTAGTTGGAGTA
ATAATCCTATAGTGAGATATGGGACAACATGACCTGGCTGCAATGGGATAAGAAATTAGCAATTATACACAAATAATA
TATGATCTAATTGAAGAATCACAGAACCCAGCAGGAAAAAGAAATGAACAAGACCTATTGGCATTTGGACAAGTGGGCAAAATCT
ATGGAAATGGTTTGACATATCAAAATGGCTGTGGTATATAAGAAATATTATATATGATAGTAGGAGGCTTAATAGGATTAA
GAATAGTTTGTCTGTAATTCAGTAAATAATAGATTAGCAGGGGATACCTCCTTTGCTGCCAGACCCCTTGCCCCG
AACCCAGGGGTCTCGACAGCCCGGAAGAAATCGAAGAAAGAGGTGGAGAGCAAGACAGAGATCGAATTCGCTTAGT
CAGCGGTTCTTAGCACTTGCCTGGAGGACCTGGGAGCCCTGTGCCCTCTTCAGCTACCAACCGCTTGAGAGACTTCATCT
TGAATGCCCGGAGGAGTGTGAACTTCTGGGACACAGCAGTCTCAAGGGTTGAGACTGGGTGGGAGGAGACTCAAGTAT
CTGGGAAATCTCCTGTGTATTGGGGTCAGGAACCTAAAAATTAGTGCTATTAGTTTGTGTATACCATAGCAATAGTAAT
AGCTGGCTGGACAGATAGGGTCAATAGAAATAGGACAAAGAAATGGTAGAGCTATTCTCAACATACCTAGAGAAATCAGGC
AGGGCGCGGAAAGGGCTTACAATAA

Fig. 8

92US077-T8 (SEQ ID NO: 13)

ATGAGAGTGAAAGGGGATCAGGAAGAAATTATCAGCACCTTGTGGAGATGGAGTACCATGCTGCTCCTTGGGATGTTAATGAT
TTGTAGTGTACAGAAACAATTGTGGGTACAGTCTATTATGGGGTACCTGTGTGGAAAGAAAGCAACACCACTCTATTTT
GTGCATCAGATGCTAAAGCATATGATACAGAGGCACATAATGTTGGGCCACATGCTGTGTACCCACAGACCCCAAC
CCACAAGAAATAGTATTGGCAAAATGTGACAGAAAGATTTTAAACATGTGGAAATAAACATGGTAGAACAGATGCATGAGGA
TATAATCAGTTTATGGGATCAAAAGCCTAAAGCCATGTGTAAATAAACCCCACTCTGTGTACTTTAAATTGCACTGATG
TAAGGAATGCTACTATTGTAGGAATAGTACTATTAGGGTCGAGGAAGGATGAAGGAAGAAATAAAAAAACTGCTCTTTTC
AATGTCACCACAAGCATGAGAGACAAGTTGCAGAAAGAGATGCAATTTTATAAATCTGATGTAATACCAATAGGTAA
TGATAATAATACTAATACCAGCAATAATAATACCTATACCAGCTATAGGTGAGAAATTGTAATACCTCAGTCATTA
CACAGGCTGTCCAAAGATAAACTTTGAGCCCAATCCCAATACATATTGTGCCCGGCTGGTTGCGATTCTGAAGTGT
AATAATAGGACGTTCCGAGGGAAGAGCCATGTAAAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTAGT
ATCAACTCAACTGCTTTAAATGGCAGTCTAGCAGAAAAAGATATAGTAATTAGATCTGCCAATTTCTCAGACAAATGCTA
AAGCCATAATAGTACAGCTGAACGAACTGTACAAATCAATTGTACAAGACCCCAACAATAACAAGAAAGAAATAACT
ATGGACCAAGGAAGAGTATATATACAAACAGGAGACATAATAGGAGACATAAGACGAGCACATTGTAAACATTAGTAAGGA
AGATTGGAATAACACTCTAAACAGATAGCTAAAAATTAAGAGAACAAATTTGGGGATATAAAAACAATAGCCCTTTAAGC
CATCCTCAGGAGGGGCCAGAAATTGTATATGCACAGTTTAAATTGTGGAGGGGAATTTTCTACTGTAAATACAAACAAA
CTGTTTAAATAGTACTTGGATGTAAATAGTACTCGGAATAATACTGAAGGTCAAGTAACAATGGAAATATCACACTTCA
ATGCAGAAATAAACAAATTATAACATGTGGCAGGGAGTAGGAAAGCAATGTATGCCCTCCCATCAGAGGACAAATTA
GATGTTTCATCAAAACATTACAGGGCTGCTATTAAACAAGAGATGTTGGTAATACCAACGATACATAACAATACTGAGATCTTC
AGACCTGGAGGAGGAGATATGAGGGACAAATTGGAGAAAGTGAATTATATAAATAAAGTAGTAAAAATTGAACCATTAGG
AATAGCACCCACCAAGGCAAGAGAGAGTGGTGCAAGAGAAAAAGCAATGGGAATAGGAGCTCTGTTCTTGGGT
TCTTGGGAGCAGCAGGAAGCAATATGGGCGCAGCTCAATGACGTCAGCGTACAGGCCAGACAACTATTGCTGTGATATA
GTCAACACAGCAAGCAATTTGCTGAGGGCTATTGAGGGCGCAACACCACTCTGTGCAACTCACAGTCTGGGCGATCAAGCA
GCTCCAGGCAAGAGTCTGCTGTGGAAGAATACCTAAAGGATCAACAGCTCCTGGGATTTGGGTTGCTCTGGAAGAAC
TCATTTGCCCACTGCTGCTTGGAAATGCTAGTTGGAGTAATAATCTCTGGATAAGATTGGAAATAACATGACCTGG
ATGCAGTGGAAAGAGAAATTGACAAATTACAAAGTCTAATATACACTTAAATTGAAGAAATCGCAGAACCAACAAGAAAA
GAATGAACCTAGAGTTACTAGAAATTAGATAAAATGGGCAAAATTTGTGGAAATTGGTTTGACATAACAAAATGGCTGTGGTATA
TAAAAATATTCATAATGATAGTAGGAGCTTGTAGTTAAGAAATAGTTTTTGTATACTTTCTATAGTGAATAGAGTT
AGGCAGGATACTCAACATTATCGTTTCAGACCCGCTCCAGCCCAAGAGGGGACCCGACAGCCCGAAGGAATCGAAGA
AGAAGTGGAGGAGAGAGACACATCCGGGCCATTAGTGGATGGATTCTTAGCAATTACTGGGTCCGACCTGGCGGA
GCCTGTTCTCTTCAGCTACCAACGCTTGAGAGACTTACTCTTGTATTGTAGCGAGGATTGTGGAACTTCTGGACGCGAGG
GGGTGGGAATCCTCAAGTATTGGTGGAAATCTCTACAGTATTGGATTTCAGGAACATAAGAAATAGTGTGTTAGCTTGCT
CAACGCCACAGCCATAGCAGTAGCTGAGGGGACAGATAGGATTATAGAAGTAGCAAGAGGACTTTTAGAGCTATTCTCC
ACATACCTAGAAAGATAAGACAGGGCTTGGAAAGGGCTTTGCTATAA

Fig. 9

93US143-T8 (SEQ ID NO: 15)

atgagtgagggaatgaaGAAATTATCAGCACTTTTGGAGATGGGGCACCAATGCTCTCTGGGGTTATTGATGATCTG
TAGTGCTGCAGATCAATTGTGGGTACACAGTCTATTATGGAGTACCTGTGTGGAAAGGAAACAACCACTCTATTTTGTG
CATCAGATGCTAAAGCATATGATAAAGAGGTACATAAATGTTTGGGCCACACATGCTGTGTACCCACAGACCCCAACCCCA
CAAGAAATACCAATTGGTAAATGTAAACAGAAAAATTTAAACATGTGGAAAAATAACATGGTAGATCAAAATGCATGAGGATAT
AATCAGTTTATGGGATCAAAAGCCTAAAGCCATGTGTAATAATACCCCACTCTGTGTACTTTAAATTTGCACTGATGATT
TGAGGAATGCTACTAATACCACTACTAATACCAATAGTAATTGGGAGAAACCAATGGAGAAAGGAGAAATAAAAACTGC
TCTTTCAAAATCACCTCAAGCATAAGAGATAAGGTACAGAAACAATATGCACCTTTTATAGCCTTGATGTAGTACCAAT
AAAGAAATAACAATAATTAGCAATAAGATTAGATATAGTTAAGAAATTTGTAACACCTCAGTCAATACACAGGCTGTC
CAAAGGTAAACCTTTGAGCCAAATCCCATACATTTATTTGCCCCGGTGTGTTGCGATTCTAAATGTAATGATAAGAAAG
TTCAATGGAAACAGGACCATGTACAAATGTCAGCACAGTACAATGTACTCATGGAAATAGGCCAGTAGTATCAACTCAACT
ACTGTTAAATGGCAGTCTAGCAGAAAGAGGTAGTAATTAGTCTGAAATTTTCACAGACAAATGCTAAAACCAATAATAG
TACAACTGAAAGACCCCTGTAGAAATCAATTGTACAAGCCCAACAGAAATGCATGGAAAGGCATACCTATTGGAGTACCA
GGGAGAAATTTCTATGCAAGAAAGAAACATAAAGAGGATATAAGCAAGCATATTGTAACTTAGTATAGCAAAAGTGGAA
TAACACTTTAAACAGATAGTTGAAATAATTAGATTACATTTTAAATAAACAATAGTCTTTAAATAGTCTCTCAGGGG
GGGACCCAGAAATTAATACTGCACAGTTTAAATTGTGGAGGGGAAATTTTCTATTGTAAATTCACAAACAATGTTTAAATAGT
ACTTGGAAATAGTACTACTGAAGGGTTAAATAACACTGGAGAAAGCCCAATCGTACTCCCATGCAGATTAAGCAAAATTAAT
AAACATGTGGCAGGAAGTAGGAAAGCAATGTATGCCCTCTCCCATCGCAGACCTAAATTAGATGCTCATCAAAATATTACAG
GGCTGCTATTAAACAAGAGATGGTGGTGTGATGAGAAACAGCAACACCGAGACCTTCAGGCTTGAGGAGGAGAAATATG
AGGGACAAATGGAGAAAGTGAATTAATAATAAAGCAGTAAATAATTGAACCTTAGGGGTAGCACCCCAACCAAGGCAAA
GAGAAGAGTGGTGCAGAGAGAAAGAGCAGTGGGAATAGGAGCTGTCTCTGGGTCTTGGGAGCAGCAGGAAAGCA
CTATGGGCGCAGCATCAATAACGCTGACGGTACAGGCCAGACAAATATTGTCTGTGATAGTGCAACAGCAGAACAAATTG
CTGAGGGCTATTGAGGCGCAACAGCATCTGTGCAACTCAGCTCTGGGCAACAAGCAGCTCCAGGCGAGAGTCTTGGC
TGTGGAAAGATACCTAAAGGATCAACAGCTCTCTGGATTTTGGGGTGTCTGGAAACTCATCTGCACCACTGCTGTGC
CTTGGAAATGCTAGTTGGAGTAATAATCTCTGGATAGGATTTGGAAATAATGACCTGGATGGAGTGGGAAAGAGAAATTT
GACAAATTACACAGGCTTAATAACAATTAATTGAAGAAATCGCAAAACCAACAAGAAAGAAATGAACAAGAAATTTAGC
ATTAGATAAATGGGCAAGTTTGTGGAAATTTGGTTTGACATAACAACCTGGCTGGTATATAAAAATATTTCATAATGATAG
TAGGAGGCTTGATAGGTTTAAGAAATAGTTTCTACTGTAATTTCTATAGTGAATAGAGTTAGCAGGGATCTCACCAATTA
TCGTTTCAGACCCCAACCCAGCTCAGAGGGAACCCGACAGGCCCGGAAGGAATCGAAGGAGAAAGGTGGAGAGAGAGACAG
AGACAGATCCGGTCCCTTAGTGGATGGATTCTTAGCAATTAATCTGGTGCACCTCGGAGCCTGTGCACTCTCTCTACC
ACCGCTTGAGAGACTTACTCTTGATTGTAAACGAGGATTGTGGAACTTCTGGGACGCAAGGGGTGGAAAGTCTCTCAATAT
TGGTGGAAATCTCTACAGTATTGGAGTCAGGAACCTAAAGAAATAGTGCTATTAACTTGCTCAACGCCACAGCCATAGCAGT
AGCTGAGGGGACAGATAGGGTTATAGAAATATTACAAAGAGCTTTTAGAGCTATTCTCCACATACCTACAAAGAAATAAGAC
AGGGCTTGAAAGGGCTTTGCTATAA

Fig. 10

96USSHIP54-T8 (SEQ ID NO: 17)

ATGAGAGTGAAGGGGATCAGGAACAAATTGGCAGCATTATGGAGATGGGGCACCATTGCTCTTGGGATGTTGATGATCTG
TAGTGCTACAGAAACAATTGTGGGTCA CAGTCTATTATGGGGTCTCTGTGTGGAGAGAAAGCAACACCACCTCTATTCTGTG
CATCAGATTCTAAAGCATATGATACAGAGGCACATAAATGTTTGGGCCACACATGCCCTGTGTACCCACAGACCCCAACCCA
CAAGAAGTATTATTGGAAAAATGTGACAGAAAAATTTAAACATGTGGAAAAAATGACATGGTAGAACAGATGCATGAGGATAT
AATCAGTCTATGGGATCAAAAGCCTAAAGCCATGTGTAATAATGCCACTAAAAATAGCTGGAAGGAGAAAAATAAAAAATTGCACTTCAATGTC
AGGAAAAATGCTAATAATACCATGATATAATGCCACTAAAAATAGCTGGAAGGAGAAAAATAAAAAATTGCACTTCAATGTC
ACCACAGCCATAAGAGATAAGGTGAAGAAACAATAATGCACCTTTTTCATAGTCTTGTAGTGTCCCAATAAAGATGCTAA
GGATAGTAACAGCTATAGGTTGATAAGTTGTAAACACCTCAGTCAATACACAGGCTGTCCAAAGACATCCTTTGAGCCAA
TTCCCATATATTATTGTCCCCGGCTGGGTTTGGGATTCTAAATGTAAACAATAAGACATTCAGTGGAAAGGACAAATGT
AAAAATGTCAGCACAGTACAAATGTACACATGGAAATTAGGCCAGTAGCATCAACTCAACTGCTGTTAAATGGCAGTCTAGC
AGAAGAAAGAGATAATAATTAGATCTGACAAATTCACAAACAATGCTAAAAATCATAATAGTACAGCTGAAAGAACCTGTAG
AAATTAATTGTACAAAGCCCGCAACAATAACAAGAAAGATACATATAGGACCCAGGAGAGCATGGTATGCCAACACAGGA
GATATAATAGGAGATATAAGACAAGCAATTGCAACCTTAGTAGTGTAAAAATGGAAATAACACTTTAAGACAGATAGCTAA
AAAAATTAGGAGAACAAATTCAGGATAAAAAATATAACCTTTAAGCAATCTCAGGAGGGGACCCAGAAATTGTAATGCACA
GTTTAAATTGTGGGGGAAATTTTCTACTGTAAATGCAACACAACCTGTTTAAATAGTACCTGGGATAATGGTACTTTGGAAT
AACAGTACTTTGGAATGAAACTGATACCTACCACTATCACACTCCCATGCAAGGATAAAACAATAATTGTAAACAATGTGGCAGAC
AGTAGGAAGAGCAAATGATGCCCTCCCATTAGAGGAGAGAAATTAGTTGTTCATCAATAATTACAGGGCTGCTATTAAACAA
GAGATGGTGGTAAATATAAATGAGACAAATGGGACTGAGATCTTTAGACCTGACAGGAGGAGATATGAGGACACAATTGGAGA
AGTGAATTATATAAATATAAAGTAGTAAAAATTGAAACCATAGGAATAGCACCCACCAAGGCAAGAGAAAGAGTGGTGCA
GAGAGAAAAAGAGCAGTGGGAGTAGGAGCTATGTTCTTGGGTCTGTGCAAGCAGCAGGAAGCACTATGGCGCAGCGT
CAGTGACGCTGACGGTACAGGCCAGACAAATTAATGTTCTGGTATAGTGCAACAGCAGCAACAATTTGCTGAGGGCTATTGAG
GCGCAACATCATCTGTGCAACTCAGCTGCGGGCATCAAGCAGCTCCAGGCAAGAGTCTGCTGGTGTGGAAAGATACCT
AGGGGATCAACAGCTCCTGGGATTTGGGGTTGCTCTGGAAACTCATCTGCACCACTACTGTGCCTTGGAAATACAGTT
GGAGTAAATAATCACTGAAATACATTTGGGATAACATGACCTGGATGCACTGGGATAAGAAATTAGCAATTACACAGGC
TTAATATACACCTTAATTGAGGAATCGCAGAACCCAGCAAGAAAGAAATGAAAAGAACTACTGGAAATTGGATAAATGGGC
AAGTTTGTGGAAATGGTTTGACATAACAACTGGCTGGTATATAAAATATTCAATAATAATAGTAGGAGGCTTGATAG
GTTTAAGAAATAGTTTACTGTACTTTCTATAGTGAATAGAGTTAGCAGGGATACCTCACTATCGTTTCAGACCCCGC
CTCCCAACCCAGAGGGGCCGACAGGCCCGGAAAGGAATCGAAAGAGAGTGGAGAGAGAGACAGACAGATCAAGAAC
ATCAGTGGATGGAATCTTAGCACTTAATCTGGGTGATCTACGGAGCCTGTGCCCTCTTCAGCTACCACTGAGAGACT
TACTCTGATTCTAGCGAGGATTGTGGAACCTTCTGGGACCGCGGGTGGGAAACCCCTCAGATATTGGTGGAAATCTCCTA
CAGTATTGGAGTCAGGAACTAAAGAAATAGTCTGTAGCTTGTCTTAATCTATAGCCATAGTAGTAGCTGAGGGAACAGA
TAGGGTTATAGAAAGTAGTACAGAGAGTTTGTAGAGCTATCCGCCACATACCTAGAGAAATAAGACAGGGCTTGGAAAGGG
CTTTGCTATAA

Fig. 11

96USHIPS9-T8 (SEQ IS NO: 19)

atgagagTgaaggagatcatgaaaattatcagcA CTGGTGGAGAGGGGGGCA TCATGTCTCCTTGGGTGTAA TGATCTG
TAGTGCTGTGAACAA ATTGTGGGTCA CAGTCTATTA TATGGGGTACCCGTGTGGAAAGAA GCAACCACTCTATTCTGTG
CATCTGATGCTAAAGCATATGATACAGAGAAACATAA TGTTTGGGCCACACATGCCGTGTGTACCTACAGACCCCAACCCA
CAAGAAGTAGTATTGGAAAATGTGACAGAAAAATTTAA CATGTGGAAAAATAACATGGTAGAACAGATGCATGAGGATAT
AATCAGTTTATGGGATCAAAAGTCTAAAGCCATGTGTAAACTAACCCCACTCTGTGTCACTTTAAACTGTAGGAAACGTTA
CTATTACCAATACTACTACCAATAGTAGTGGCTGGAAACTAATGGAGGAAGGAGAAATAAAAACTGCTCTTTCAAAAATC
ACCACAATCTGAGACATAAGATGCAGGAAGAACATGCACCTTTTATAAATCAGATGTAGTACCACCTAGGTAAATAATAG
TGCAATAGGTAATAATAATGCCAGATATAGGTTGATAAGTTGTAAACCTCAACCAATACACAGGCCTGTCCAAAGGTAT
CCTTTGAGCCAA TCCCATACATTATTGTGCCCCGGTGTGCGATTCTCTAAATGTAGAGATAAGAA GTTCAATGGA
ACAGGACCATGTAAAGATGTGACGACAGTACAATGTACACATGGAAATTAAGCCAGTAGTATCAACTCAACTACTGTIAAA
TGGCAGCTAGCAGAAGAAGATATAGTAATTAGATCTGCCAATTTCTCAGACAAATGCTAAAAATCATAA TAGTACAGCTGA
ATAAACTGTAGTAATTAATTGTACAAAGACCCCAACAAATAACAAAGAAAAGGTATAAATATAGGACCAGGAAGAACAGTT
TATGCAACAGGA AAAATAATAGGAGATATAAGACAAGCACATTGTAAACATTAGTAAAGGAGAA TGGTATAACACTTTAAA
GCAGGTAGTTACAAAATTAGGAGAACATTTTAAAGAA TAAACAA TAGCCTTTAATAA TCCTCAGGAGGGGACCCAGAAA
TTGTAAAGCACACTTTAAATTGTGGAGGGGAATTTTCTACTGTGATTCAACAAAATTGTTTACTAGTACTTGGAACTAT
ACTAATGGTACTTGGAAATAGTACTAACTGGAATGATCTGAAATGTTGAAATAAAACAATCA CACTCCCATGCGAGAAATAAA
ACAAAATTGTAAACATGTGGCAGGAAGTAGGGAAGCAA TGTATGCCCTCCCATCAGCGGACTTATTACATGTTTCATCAA
ATATTACAGGACTACTATTAAACAAGAGATGGTGGTAGTAACACGAACACCAACCGAGGTCTTCAGACCTGGAGGAGGAAAT
ATGAAGGACAAATTGGAGAAAGTGAAATTATA TAAATATAAAGTAGTAAAAATTGAACCAATTAGGAGTAGCACCCACCAAGGC
AAAAAGAAAGATGGTGCAGAGAGAAAAAGAGCAGTGGGAATAGGAGCTCTGTCCTTGGGTCTTGGGAGCAGCAGGAA
GCACTATGGCGCAGCGTCACTGACGCTACGGTACAGACCAGACAAATTA TTGCTCTGGTATAGTGCAGCAGCAGAACAAAT
CTGCTGAGGGCTATTGAGGGGCAACAGCATCTGTTGCAACTCA CAGTCTGGGGCATCAAGCAGCTCCAGGCAAGAGTCCT
GGCTGTGGAAGATACCTAAAGGATCAACAGCTCCTGGGATTGGGGTGTCTCTGGA AAACTCATTTGCACCACTACTG
TGCCTTGGAA TGCTAGTTGGAGTAATAATCTCTGGATGATATTGGCAGAACATGACCTGGATGGAGTGGGAAAGAGAA
ATTGACAAATTACACAAATGTAATATACAAATTTAATTGAAGAA TCGCAGAACCAAGCAAGAAAAGAAATGAACAA GACTTATT
AGCATTTGGATAAATGGGCAAGTTTGTGGGATTGGTTAGCATATCAAACTGGCTGTGTATATAAAAATATTCATAATGA
TAGTAGGAGGCTTGATAGGTTAAGATAATTTTACTGTACTTCTATAGTGAATAGAGTTAGGCAGGGGATCTCACCA
TTATCGTTTTCAGACCCGCTTCCAGCCCCGAGGGGACCCGACAGGCCCGAAGGAATCGAAGAAAGGAGGTGGAGAGAAAGA
CAGAGACAGATCCGGCTATTAGTGAAACGGAATCTTTGCACTTATCTGGGTGGACCTACGGAGCCTGTGCCTCTTCAGCT
ACCACCGCTTGAGAGACTTACTCTTGATTGACGCGAGAAATTGTGGAGCTTCTGGGACGCGAGGGGTGGGAAAATCCTCAAG
TATTGGTGGAAATCTCTGCAAGTATTGGAGTCAGGAACCTAAAGAAATAGTGTGTTAGCTTGCTTTAATGTCA CAGCCATAGC
AGTAGCTGAGGGGACAGATAGGATTCTAGAAAGTATTACAAAGAGCTTATAGAGCTATTATTACATACCTAGAGAAATAA
GACAGGGCTTAGAAAAGGGCTTTGCTATAA

Fig. 12

Fig. 13